

P-Wave Enhancement in Rough Terrain using Multicomponent Seismic Data: Catatumbo, Colombia

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Abstract/Excerpt

The sensitivity of 3C sensors to the vector properties of the signal may improve P-wave information in rough terrain. In this work, data processing taking into account the topography illustrates this point. Multicomponent data, from a mildly rough topography and folding geology setting in the Northern Andes in Colombia, was used in this study. The seismic data were acquired with 3C sensors oriented vertically. From ray trace modeling taking into account the low velocity layer, waves should arrive almost normal to the surface. Consequently the rotation of the radial and vertical data into a direction normal to the topography would better separate P- and Swaves. Assuming this hypothesis, P-wave data was estimated using both the vertical and horizontal components and compared with using the vertical alone. Improvement can be observed in the P-wave stacked section after this mode separation, which suggests that this procedure can be better than the usual identification of P- wave with the vertical component.